

Appl. No. 10/019,460
Amendment and/or Response
Reply to Office action of 20 January 2004

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Amendments to the Claims:

A listing of the entire set of pending claims (including amendments to the claims, if any) is submitted herewith per 37 CFR 1.121. This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Previously presented) A deflection unit for a cathode ray tube, the deflection unit comprising:

line deflection coils,

frame deflection coils surrounding the line deflection coils, and

a yoke ring having a magnetic permeability μ_r and surrounding the frame deflection coils, wherein

the deflection unit comprises a magnetic material which is present between the line deflection coils and the frame deflection coils and has a magnetic permeability μ_1 which satisfies the relation $\mu_1 < \mu_r$.

2. (Previously presented) A deflection unit as claimed in claim 1, wherein

void spaces are present between the line deflection coils and the frame deflection coils, and

the void spaces are filled with the magnetic material.

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3. (Currently amended) A deflection unit as claimed in claim 2, comprising:
line deflection coils,
frame deflection coils surrounding the line deflection coils, and
a yoke ring having a magnetic permeability μ_r and surrounding the frame deflection coils, wherein
the deflection unit comprises a magnetic material which is present between the line deflection coils and the frame deflection coils and has a magnetic permeability μ_1 which satisfies the relation $\mu_1 < \mu_r$,
void spaces are present between the line deflection coils and the frame deflection coils,
the void spaces are filled with the magnetic material,
second void spaces are present between the frame deflection coils and the yoke ring,
and
third void spaces are present between wire strands of the frame deflection coils, and
at least one of the second and/or third void spaces are filled with a magnetic material having a magnetic permeability μ_2 which satisfies the relationship $\mu_2 \geq \mu_1$.

4. (Previously presented) A deflection unit as claimed in claim 3, wherein
the yoke ring comprises at least two parts, a first part being positioned closer to a neck portion of the cathode ray tube than a second part, and
wherein
only the void spaces surrounded by the first part of the yoke ring are filled with the magnetic material.

5. (Previously presented) A deflection unit as claimed in claim 1, wherein
the deflection unit further comprises a support for carrying both the frame and the line coils,
said support comprising the magnetic material.

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6. (Previously presented) A deflection unit as claimed in claim 4, wherein the first and/or the second part have four coils for generating a magnetic quadrupole field.

7. (Previously presented) A deflection unit as claimed in claim 6, wherein said coils comprise electrically conductive wires which are toroidally wound in a winding direction and in accordance with a winding density distribution $N(\phi)$ given by $N(\phi) = N_0 \cos(2\phi)$;

where

ϕ is an angle enclosed by an X-direction and a line between an element of the coil and the center, which ranges between 0° and 360° ,

N_0 is the winding density at ϕ equal to 0° , and the sign of $N(\phi)$ denotes the winding direction.

8. (Currently amended) A deflection unit as claimed in claim 4, wherein the yoke ring further comprises a third part which is positioned closer to the neck portion of the cathode ray tube than the first part.

9. (Previously presented) A cathode ray tube assembly comprising a deflection unit as claimed in claim 1.

10. (Previously presented) A display apparatus, comprising:
a cathode ray tube assembly as claimed in claim 9,
control electronics coupled to receive a video signal to apply a display signal to the cathode ray tube and deflection signals to the deflection unit in dependence on the video signal.

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11. (Previously presented) A deflection unit for a cathode ray tube, comprising:
line deflection coils,
frame deflection coils surrounding the line deflection coils, and
a yoke ring surrounding the frame deflection coils, comprising at least two parts, a
first part being positioned closer to a neck portion of the cathode ray tube than a second part,
wherein
void spaces are present between the line deflection coils and the frame deflection
coils, and
the void spaces surrounded only by the first part of the yoke ring are filled with
magnetic material.

12. (Previously presented) The deflection unit of claim 11, wherein
the yoke ring has a magnetic permeability μ_r ,
the magnetic material has a magnetic permeability μ_1 , and
 $\mu_1 < \mu_r$.

13. (Previously presented) The deflection unit of claim 11, wherein
the first part includes four coils for generating a magnetic quadrupole field.

14. (Previously presented) The deflection unit of claim 13, wherein
the four coils comprise electrically conductive wires which are toroidally wound in a
winding direction and in accordance with a winding density distribution $N(\phi)$ given by $N(\phi) = N_0 \cos(2\phi)$; where ϕ is an angle enclosed by an X-direction and a line between an
element of the coil and the center, which ranges between 0° and 360° , N_0 is the winding
density at ϕ equal to 0° , and the sign of $N(\phi)$ denotes the winding direction.

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15. (Previously presented) The deflection unit of claim 11, wherein
the yoke ring further comprises
a third part that is positioned closer to the neck portion of the cathode ray tube
than the first part.
16. (Previously presented) A cathode ray tube assembly comprising a deflection unit as
claimed in claim 11.
17. (Previously presented) A display apparatus, comprising:
a cathode ray tube assembly as claimed in claim 16,
control electronics coupled to receive a video signal to apply a display signal to the
cathode ray tube and deflection signals to the deflection unit in dependence on the video
signal.
18. (New) A deflection unit comprising:
line deflection coils,
frame deflection coils surrounding the line deflection coils,
a yoke ring surrounding the frame deflection coils,
first magnetic material between the line deflection coils and the frame deflection coils,
and
second magnetic material between the frame deflection coils and the yoke ring.
19. (New) The deflection unit of claim 18, wherein
a magnetic permeability of the yoke ring is greater than a magnetic permeability of the
first magnetic material and the second magnetic material.
20. (New) The deflection unit of claim 19, wherein
the magnetic permeability of the second magnetic material is greater than the magnetic
permeability of the first magnetic material.